December 21, 1998 VPCD-98-16 (LDV/LDT/SV/ICI)

Dear Manufacturer:

Subject: Single Roll Dynamometer Adjustment and Road Force Determination.

This letter sets forth procedures for determining vehicle road force and simulating it on a single roll dynamometer. The goal of of this process is to have dynamometer operation match road operation as closely as possible. Alternative methods that accomplish this goal are acceptable.

Populations. The manufacturer's product line is divided into populations having similar road force characteristics. Factors that affect road force (e.g. body style, weight, tire type, transmission configuration, aerodynamic options, etc.) shall be considered. A manufacturer may include vehicles with lower road force in a given population, such vehicles shall not be considered when selecting a representative vehicle.

Representative Vehicle. Manufacturers shall select a vehicle for coastdown testing from within the population that satisfactorily represents each vehicle design within the population. It is the expectation that if any production vehicle is tested within the population, the road force would be similar to that reported for the representative vehicle.

Manufacturers have the responsibility to update their application to reflect actual production. This may be especially important when the "representative" vehicle is a prototype.

Road Force. Road force, as a function of speed, shall be determined for the representative vehicle. EPA will use the SAE J2263 procedure for confirmatory coastdown testing, manufacturers may use any procedure or method that yields equivalent results. For example, tire dynamometer or wind tunnel data may be used to adjust test results from one population to stand for another. Also, results from multiple vehicles can be mathematically combined to yield a more representative average.

Dynamometer Adjustment. Prior to emission or fuel economy testing, the manufacturer shall evaluate each test vehicle on the single roll dynamometer to determine the proper dynamometer adjustments to simulate road force. These adjustments can be used for subsequent testing for that test vehicle and population. (Specific dynamometer adjustments must be established for each vehicle population represented by a given test vehicle.) For confirmatory testing at EPA, the Agency may choose to conduct its own evaluation of the actual test vehicle on its dynamometer to

determine the proper dynamometer adjustments (i.e., the “A, B and C” coefficients) or may choose to accept the manufacturer’s determined values.

Quick Checks. After completing the highway fuel economy test, the manufacturer shall verify that the vehicle-dynamometer combination reproduced the required road force (allowing normal vehicle and test variability.) The Agency may perform the SAE J2264 full speed range coastdown or a single speed evaluation (e.g., 55 to 45 mph quick check) after completion of the test sequence. Manufacturers may use any procedure that yields equivalent results.

Tolerances. EPA is not establishing any performance tolerances at this time. It is expected that manufacturer road force submissions will represent their populations, confirmatory testing on production vehicles should not indicate any overall bias. Also, EPA believes that the dynamometer “quick check” tolerance (formerly employed on twin roll dynamometer tests) is no longer appropriate. The single roll dynamometer should be much more accurate and repeatable, thus eliminating one source of error. Also, since each test vehicle will receive is own dynamometer adjustment (rather than generic settings), vehicle to vehicle offsets will not occur. Although the dynamometer tolerance in SAE J2264 appears to be appropriate for most vehicles, EPA is not adopting it at this time. If necessary, this topic may be considered again in the future after additional experience with the single roll dynamometer and procedures. Manufacturer input will be solicited at that time.

If you have any questions, please contact Mr. Eldert Bontekoe of my staff at (734) 214-4442.

Sincerely,

Jane Armstrong, Director
Vehicle Programs and Compliance Division
Office of Mobile Sources